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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,379	06/22/2001	Peter Dannenberg	GK-GEY-1112/	7202

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[REDACTED] EXAMINER

CHANG, AUDREY Y

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

2872

DATE MAILED: 05/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No.	Applicant(s)
	09/830,379	DANNENBERG ET AL.
Examiner	Art Unit	
Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 March 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 12, 14, 16, 17 and 19-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 12, 14, 16, 17 and 19-27 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____

- 4) Interview Summary (PTO-413) Paper No(s) _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on *March 21, 2003* has been entered.
2. This Office Action is also in response to applicant's amendment filed on March 21, 2003, which has been entered as paper number 13.
3. By this amendment, the applicant has amended claims 12, 14, 19 and 23.
4. Claims 12, 14, 16-17 and 19-27 remain pending in this application.
5. The rejections to claims 12, 14, 16-17 and 19-22 under 35 USC 112, second paragraph, and the rejections to claims 23-27 under 35 USC 112, first paragraph, set forth in the previous Office Action are *withdrawn* in response to applicant's amendment.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
7. Claims 12, 14, and 20, are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Farmiga (PN. 5,828,505) in view of the patents issued to Vinther (PN. 4,794,492) and Takahashi et al. (PN. 5,735,793).

Farmiga teaches an *optical beam-shaping uniformizer construction and methods* for producing it, wherein the construction comprises the step of integrating or assembling at least two mirrored slabs (11 and 12) together to form a cavity within wherein the inner surface forming the cavity are coated with mirror coating. The mirrored slabs are fastened to form the cavity by using fastening means such as clamping means, (please see Figures 1B, 1C, 3, 4A-4C, 5A-5C). The beam-shaper uniformizer construction homogenizes the light as it enters the construction cavity from an input surface and exits from an output surface. Farmiga teaches that the mirrored slabs are made of *mirror-coated* glasses, which means the mirror coating is applied to the slabs before assembly, (please see column 4, line 30).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly to have the at least two mirrored slabs engaged with projection and cutout. However to use cutout and projection arrangement to engage optical elements is common in the art as shown by the teachings of Vinther wherein in a light pipe the reflector (4, Figure 2) that forms the side surface of the cavity is engaged to other side of the cavity by projection/cutoff arrangement, (please see the mounting profile 14 of Figure 1). Furthermore, the *manner* of *engaging* the mirrored slabs or the reflective surfaces to form the cavity does not really affect the function of the optical beam shape uniformizer. It is really a matter of design choice to one skilled in the art to use one engaging means or the other to form the cavity. Such modification would also have been obvious to one skilled in the art since one can adopt the teachings of Vinther to have different design for engaging the mirrored surfaces to form the cavity for the benefit of providing different design for the optical beam shape uniformizer.

These references also do not teach to have the cavity being covered with a shrink tubing. However using shrink tubing as a fastening means for holding two optical elements together in order to form optical cavity or simply to cover an optical means is very well known in the art as demonstrated by the teachings of Takahashi et al. *Takahashi et al* teaches a **heat shrinking tube** (300, Figure 8) that may be *wrapped* around the junction of a suction tube (100) and a pipe (132) so that the suction tube and the

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pipe are jointed and fastened to form the desired optical pipe with a cavity within, (please see Figure 8, column 14, lines 36-49). Takahashi et al teaches that the shrinking tube is shrunk so that it applied certain strength to the junction. It would then have been obvious to one skilled in the art to apply the teachings of Takahashi et al as an alternative fastening means to fasten the mirrored slabs of Farmiga in place in order to form the uniformizer construction for the benefit of providing a fastening means with *no light-collecting gapes* formed in the interior of the joint, which implicitly *will be light-proof*. With regard to the positions of applying the heat shrinking tube it would have been considered to be an obvious matters of design choice to one skilled in the art since the positions of joints therefore the positions of the tube do not effect the performance of the beam-shaper construction as along as the general geometric shape is kept.

8. . . Claims 16, 17 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Farmiga, Vinther and Takahashi et al as applied to claims 12 and 14 above, and further in view of the patent issued to Levis et al (PN. 5,902,033).

The optical beam-shaper-uniformizer construction taught by Farmiga in view of the teachings of Vinther and Takahashi et al as described for claims 12 and 14 above have met all the limitations of the claims. Farmiga teaches that the construction with cavity within forms a *geometric prism* with various geometric shapes of inlet and outlet surfaces, (please see Figure 6). However it does not teach explicitly that the surfaces are of rectangular or square shape. *Levis et al* in the same field of endeavor teaches a light pipe integrator (15, Figure 1, 8, 9 and 10), wherein the light integrator is in the form of a geometric prism with *rectangular shape or square shape* of inlet and outlet surfaces for the benefit of providing desired beam shape to illuminate a liquid crystal display device. It would then have been obvious to one skilled in the art to apply the teachings of Levis et al to modify the beam-shaper construction of Farmiga for the benefit of providing a uniform light beam with desired rectangular or square beam shape.

With regard to claims 21 and 22, Farmiga does not teach explicitly to use the beam shaper construction to illuminate a matrix of image display elements. However it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987). Furthermore, it is rather well known in the art to use the tube typed beam shaper to illuminate matrix of image elements as demonstrated by the teachings of Levis et al wherein the light pipe integrator (15) is utilized to illuminate a light modulator panel such as *liquid crystal image display* (21) to create images, (please see Figures 1 and 2). It is well known in the art that light modulator panel such as LCD has a matrix form of image elements. It would then have been obvious to one skilled in the art to apply the teachings of Levis et al to apply the light shape uniformizer construction of Farmiga to illuminate a light modulator panel for the benefit of providing an image projection device. Although these references do not teach explicitly that the light modulator panel is a matrix of tilted mirrors however such arrangement which known in the art as deformable micromirror device (DMD) is a standard image display device in the art such modification would therefore have been an obvious matter of design choice to one skilled in the art.

9. **Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Farmiga in view of the patents issued to Vinther, Takahashi et al and Lewis et al.**

Farmiga teaches an *optical beam-shaping uniformizer construction and methods* for producing it, wherein the construction comprises the step of integrating or assembling at least two mirrored slabs (11 and 12) together to form a cavity within wherein the inner surface forming the cavity are coated with mirror coating. The mirrored slabs are fastened to form the cavity by using fastening means such as clamping means, (please see Figures 1B, 1C, 3, 4A-4C, 5A-5C). The beam-shaper uniformizer construction homogenizes the light as it enters the construction cavity from an input surface and exits

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from an output surface. Farmiga teaches that the mirrored slabs are made of mirror-coated glassed which means that the mirror coating is applied to the slabs before assembly, (please see column 4, line 30).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly to have the at least two mirrored slabs engaged with projection and cutout. However to use cutout and projection arrangement to engage optical elements is common in the art as shown by the teachings of Vinther wherein in a light pipe the reflector (4, Figure 2) that forms the side surface of the cavity is engaged to the other side of the cavity by projection/cutout arrangement, (please see the mounting profile 14 of Figure 1). Furthermore, the *manner* of *engaging* the mirrored slabs or the reflective surfaces to form the cavity *does not really affect* the function of the optical beam shape uniformizer. It is really a matter of design choice to one skilled in the art to use one engaging means or the other to form the cavity. Such modification would also have been obvious to one skilled in the art since one can adopt the teachings of Vinther to have different design for engaging the mirrored surfaces to form the cavity for the benefit of providing different design for the optical beam shape uniformizer. The features concerning the parts of 2 T-shaped and 2 I-shaped parts are considered to be obvious matter of design choice to one skilled in the art. Since the geometry of the slabs does not affect the function of the beam shape uniformizer at all.

With regard to the shrinking tube, this reference does not teach such explicitly. However using shrink tubing as a fastening means for holding two optical elements together in order to form optical cavity or simply to cover an optical means is very well known in the art as demonstrated by the teachings of Takahashi et al. *Takahashi et al* teaches a heat shrinking tube (300, Figure 8) that may be *wrapped* around the junction of a suction tube (100) and a pipe (132) so that the suction tube and the pipe are jointed and fastened to form the desired optical pipe with a cavity within, (please see Figure 8, column 14, lines 36-49). Takahashi et al teaches that the shrinking tube is shrunk so that it applied certain strength to the junction. It would then have been obvious to one skilled in the art to apply the teachings of Takahashi

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et al as an alternative fastening means to fasten the mirrored slabs of Farmiga in place in order to form the uniformizer construction for the benefit of providing a fastening means with *no filth-collecting gapes* formed in the interior of the joint, *which implicitly will be light-proof*. With regard to the positions of applying the heat shrinking tube it would have been considered to be an obvious matters of design choice to one skilled in the art since the positions of joints therefore the positions of the tube do not effect the performance of the beam-shaper construction as along as the general geometric shape is kept.

Farmiga teaches that the construction with cavity within forms a geometric prism with various geometric shapes of inlet and outlet surfaces, (please see Figure 6). However it does not teach explicitly that the surfaces are of rectangular or square shape. *Levis et al* in the same field of endeavor teaches a light pipe integrator (15, Figure 1, 8, 9 and 10), wherein the light integrator is in the form of a geometric prism with *rectangular shape or square shape* of inlet and outlet surfaces for the benefit of providing desired beam shape to illuminate a liquid crystal display device. It would then have been obvious to one skilled in the art to apply the teachings of Levis et al to modify the beam-shaper construction of Farmiga for the benefit of providing a desired uniform beam shape.

The features recited in claims 26-27 are the same as in claims 21-22 and they rejected for the same reasons stated above.

Response to Arguments

10. Applicant's arguments filed on March 21, 2003 have been fully considered but they are not persuasive.

11. In response to applicant's arguments, which state that the shrinking tube cannot be applied on the mirrored slabs of the uniformizer construction of Farmiga since it applies forces to the sides of the slabs which makes the slabs moved transversely, the examiner respectfully disagrees for the reasons stated below. As demonstrated by Figure 4C of Farmiga, it is clear that if one wraps the shrink tube around the circumference of the slabs, the forces exerted on the tube will include the forces in the same directions as

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shown in the Figure for holding the slabs and the forces exerted on the sides of the slabs. However by the Newton's Law of motion the *resultant* force applied on the sides will be zero and will not make the slabs move transversely. The shrinking tube therefore is perfectly useable in the construction of Farmiga.

12. The applicant is respectfully reminded that the manner of engaging the mirrored slabs and geometry of the mirrored slabs for forming the cavity really do not introduce any *patentable* or novel limitations to the claims since the manner of fastening or engaging the slabs and the geometry of the slabs for making up the optical cavity, without effecting the shape of the cavity, really are simple DESIGN features of the optical cavity that do not effect the function of the optical cavity at all.

13. In response to applicant's arguments concerning the cited Takahashi et al, the examiner wishes the applicant can study the reference closely particularly at Figure 8 and column 14 lines 37-49 for the explicit teaching of the heat shrinking tube (300) for holding two elements for forming the optical pipe.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Audrey Y. Chang
Primary Examiner
Art Unit 2872*

A. Chang, Ph.D.
May 27, 2003